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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PD53547PC		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/12075	International filing date (day/month/year) 30.10.2003	Priority date (day/month/year) 01.11.2002	
International Patent Classification (IPC) or both national classification and IPC G02F1/1335			
Applicant SONY ERICSSON MOBILE COMMUNICATIONS AB et al			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 20.04.2004		Date of completion of this report 26.01.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Frank, W Telephone No. +49 89 2399-7685	



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/12075

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-8 as originally filed

Claims, Numbers

1-10 received on 02.11.2004 with letter of 01.11.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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International application No. **PCT/EP 03/12075**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-8
	No: Claims	1,2,9,10
Inventive step (IS)	Yes: Claims	
	No: Claims	3-8
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The present application does not meet the requirements of Art. 33(1) PCT, the subject-matter of claims 1, 2, 9, 10 lacking novelty (Art. 33(2) PCT), and the subject-matter of claims 3-8 lacking an inventive step (Art. 33(3) PCT).

- 1.0 The following document is referred to in this report:

D1: US 2002/0145688 A1

- 1.1 The document D1 discloses (see paragraphs [0183] to [0192] and Fig. 10) a display suitable for a portable electronic device, comprising a substantially transparent display layer (liquid crystal layer 15) having a front side provided for displaying information, and a rear side, a colour filter layer (28), a translector layer (44) comprising reflectors, and a back illumination source (31). In paragraph [0002], D1 points out that the disclosed invention, hence also the embodiment discussed in paragraphs [0183] to [0192] and Fig. 10, concerns a transfective liquid crystal display with "reduced power consumption" adapted to be operated in a reflective mode with ambient light or a transmissive mode with back illumination. Hence, it is implicitly disclosed that the back illumination source (31) is adapted to be switched on and off according to the ambient light level in order to save power. As is evident from Fig. 10, the translector layer (44) comprising reflectors is provided on the front, i.e. user, side of the colour filter layer (28), such that the incident ray of light (35) is reflected by a reflector of layer (44) so as to leave the display as ray (36) without passing through the colour filter layer (28) (see also par. [0190]). Therefore, D1 anticipates the subject-matter of present claim 1.
- 1.2 D1 further discloses that the colour filter layer (28) is located on the rear side of the display layer (15) having a front side facing the display layer (15), said front side being provided with a translector layer (44) comprising reflector and hole areas. D1 therefore also anticipates the subject-matter of claim 2.
- 1.3 The additional features of the subject-matter of claims 3-8 are obvious modifications of the subject-matter of claim 2 which do not result in any particular and unexpected technical effect. In particular, referring to claims 3 and 4, D1 mentions the importance of the ratio of the reflector area to the hole area, but

does not indicate any particular values for this ratio, so that the skilled person would be prompted to select this ratio by routine design procedures according to the task at hand, thereby arriving at values in the ranges defined in claims 3 and 4.

- 1.4 D1 mentions in par. [0229] that the liquid crystal display panels disclosed therein may be applied to timepieces, so that the subject-matter of present claims 9 and 10 which depend on claim 1 and 2, respectively, also lacks novelty.
- 1.5 It is appreciated that the device according to D1 comprises a further colour filter layer (9) which is located on the front side of the translector layer (44), so that the light reflected by the translector layer (44) passes through that further colour filter layer (9). However, the wording of the present claims does not exclude the presence of such a further colour filter layer, the claims only specify the presence of a colour filter layer under the transfective layer, which is clearly disclosed by D1. There also does not seem to exist any sufficient basis in the application for excluding the presence of a further colour filter layer. Moreover, even if such a basis existed, it would be obvious for the skilled person to drop the upper colour filter layer (9) disclosed by D1 so as to maximise the display brightness in reflective mode if colour display was not required, since D1 already points in that direction (see par. [0190], which teaches that in reflective mode, high display brightness may be preferable over good colour quality).
2. The subject-matter of claims 1-10, relating to liquid crystal displays, is obviously industrially applicable (Art. 33(4) PCT).
3. The following further deficiencies are noted:
 - 3.1 Since the display units of the portable electronic devices which are the subject-matter of claims 9 and 10 have the same features as the display units according to claims 1 and 2, respectively, claims 9 and 10, which are worded as independent claims, are in fact dependent on claims 1 and 2, respectively, and therefore do not comply with the requirements of R. 6.4(a) PCT.
 - 3.2 The description fails to identify relevant prior art (R. 5.1(a)(ii) PCT).

CLAIMS

1. Display unit for a portable electronic device, comprising:

- an essentially transparent display layer (5) having a front side (5a) provided for displaying information, and a rear side (5b),
 - a colour filter layer (4),
 - a reflector (2),
 - a lighting system (7) for illuminating the transparent display layer (5) from the rear side (5b), said lighting system (7) adapted to be switched on, or off,
- wherein when the lighting system (7) is switched on, the display unit (1) operates in an emissive mode, wherein when the lighting system (7) is switched off, the display unit (1) operates in a reflective or transfective mode, wherein the reflector (2) is provided on a front side (4a), facing a user, of the colour filter layer (4), such that reflected light does not have to travel through the colour filter layer (4).

2. Display unit according to claim 1, wherein the display layer (5) on the rear side (5b) is provided with a color filter layer (4) having a front side (4a) facing the display layer (5), said front side (4a) being provided with at least one reflector (2).

3. Display unit according to claim 2, wherein the reflector(s) (2) covers less than 50 % of the total area of the rear side (4b) of the filter layer (4).

4. Display unit according to claim 2, wherein the reflector(s) (2) covers less than 25 % of the total area of the front side (4a) of the filter layer (4).

5. Display unit according to claim 3 or 4, wherein the reflector (2) is provided in the center of the front side (4a) of the filter layer (4).

6. Display unit according to claim 3 or 4, wherein the reflector(s) (2) is/are provided adjacent to an edge of the front side (4a) of the filter layer (4).

7. Display unit according to any one of the claims 3-6, wherein the reflector (2) has rectangular shape.

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8. Display unit according to any one of the claims 3-6, wherein the reflector (2) has circular shape.

9. Portable electronic device comprising:

- 5 - at least one display unit (1), comprising:
- an essentially transparent display layer (5) having a front side (5a) provided for displaying information, and a rear side (5b),
- a colour filter layer (4),
- a reflector (2),
- 10 - a lighting system (7) for illuminating the transparent display layer (5) from the rear side (5b), said lighting system (7) adapted to be switched on, or off,
- wherein when the lighting system (7) is switched on, the display unit (1) operates in an emissive mode, wherein when the lighting system (7) is switched off, the display unit (1) operates in a reflective or transfective mode, wherein the reflector
- 15 (2) is provided on a front side (4a), facing a user, of the colour filter layer (4), such that reflected light does not have to travel through the colour filter layer (4).

10. Portable electronic device according to claim 9, wherein the display layer (5) on the rear side (5b) is provided with a color filter layer (4) having a front side (4a) facing the

20 display layer (5), said front side (4a) being provided with at least one reflector (2).

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